

Application No.: 10/450,676

Docket No.: 22106-00031-US1

AMENDMENTS TO THE CLAIMS

This listing of the claims will replace all prior versions and listings of the claims in this application.

Listing of the Claims:

1. (Original) A low-voltage circuit-breaker comprising at least one mobile contact (10), which can be coupled to/uncoupled from a corresponding fixed contact (20) and a positive-opening-operation device (30), said positive-opening-operation device (30) comprising: a moving element (40) associated to the mobile contact (10); a first kinematic chain (50) operatively associated to said mobile contact (10) and to an actuating device (11); and a second kinematic chain (60) associated to said moving element (40) and to said first kinematic chain (50), a first lever (51) being associated to the first kinematic chain (50) and a second lever (61) being associated to the second kinematic chain (60), said first and second levers (51, 61) interacting with one another during the opening operation and being equipped with blocking devices (70) in the event of welding of the contacts (10, 20) together.
2. (Original) The circuit-breaker according to claim 1, wherein said positive-opening-operation device (30) comprises a first spring (42) associated to said moving element (40) and a second spring (53) associated to said first and second kinematic chains (50, 60).
3. (Original) The circuit-breaker according to claim 2, wherein an opening operation of the contacts (10, 20) as a result of a force applied on said actuating device (11) comprises: a first phase, in which the first kinematic chain (50) moves as a result of said force applied on said actuating device (11), storing energy in said second spring (53), the second kinematic chain (60) remaining substantially stationary; and a second phase, in which the second kinematic chain (60) moves as a result of the release of energy stored in said first spring and/or second spring (53) and/or as a result of the interaction between said first and second levers (51, 61).

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4. (Original) The circuit-breaker according to claim 3, wherein in said second phase and in the event of welding of the contacts (10, 20) together, the movement in opening of said first kinematic chain is blocked by said blocking devices (70) of said first and second levers (51, 61).

5. (Original) The circuit-breaker according to claim 1, wherein said first lever (51) transfers to said second lever (61) at least part of the kinetic energy $E_{sub.k}$ possessed by the first kinematic chain (50) in the opening phase, and in that said second lever (61) transfers to said moving element (40), through the second kinematic chain (60), at least part of the kinetic energy $E_{sub.k}$ received from said kinematic chain (50).

6. (Original) The circuit-breaker according to claim 1, wherein said moving element comprises: a contact-bearing shaft (41), which rotates about its own axis (100) and from which there projects at least one mobile contact (10); and at least one first spring (42) that acts on said contact-bearing shaft (41) and on said mobile contact (10).

7. (Original) The circuit-breaker according to claim 1, wherein said first kinematic chain (50) comprises: a first hinge (200); a third control lever (52), which is pivoted on said first hinge and is operatively connected to said actuating device (11); and a second spring (53), constrained to said third control lever (52) and operatively connected to said second kinematic chain, the first lever (51) being fixed to said third control lever (52).

8. (Original) The circuit-breaker according to claim 1, wherein said second kinematic chain (60) comprises: a second hinge (300); a first crank (62); a first connecting rod (63); and a first fork (64), the first crank (62) being pivoted on said second hinge (300), the first connecting rod (63) having a first end pivoted on said contact-bearing shaft (41), said second spring (53) and a first end of said first fork (64) being operatively connected to said first connecting rod (63), a point of said first fork (64) being pivoted on said first crank (62), and the second lever (61) projecting from said first fork (64).

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9. (Original) The circuit-breaker according to claim 6, wherein said first kinematic chain (50) comprises: a first hinge (200); a third control lever (52), which is pivoted on said first hinge and is operatively connected to said actuating device (11); and a second spring (53), constrained to said third control lever (52) and operatively connected to said second kinematic chain, the first lever (51) being fixed to said third control lever (52).

10. (Original) The circuit-breaker according to claim 9, wherein said second kinematic chain (60) comprises: a second hinge (300); a first crank (62); a first connecting rod (63); and a first fork (64), the first crank (62) being pivoted on said second hinge (300), the first connecting rod (63) having a first end pivoted on said contact-bearing shaft (41), said second spring (53) and a first end of said first fork (64) being operatively connected to said first connecting rod (63), a point of said first fork (64) being pivoted on said first crank (62), and the second lever (61) projecting from said first fork (64)

11. (Original) The circuit-breaker according to claim 10, wherein an opening operation of the contacts (10, 20) as a result of a force applied on said actuating device (11) comprises: a first phase, in which said third lever (52) rotates about said hinge (200), storing energy in said second spring (53), the second kinematic pair (60) remaining substantially stationary; and a second phase, in which said third lever (52) continues to rotate about said hinge (200), transferring, via an interaction between said first and second levers (51, 61), at least part of the kinetic energy E_k to said second kinematic chain (60).

12. (Original) The circuit-breaker according to claim 11, wherein said second phase comprises: a first step, in which the contact-bearing shaft (41) rotates about its own axis (100) as a result of the action of said second spring (53) through the first connecting rod (63), as a result of the action of said first spring (42) and as a result of the action of the first lever (51) through the second lever (61) and the first fork (64), the mobile contact (10) remaining substantially stationary; and a second step, in which the contact-bearing shaft (41) continues to rotate about its

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own axis (100) drawing along with it said mobile contact (10).

13. (Original) The circuit-breaker according claim 12, wherein, in the event of welding of the contacts together, at the end of said first step of said second phase, the rotation of the third lever (52) about said first hinge (200) is prevented by said blocking devices for blocking said first and second levers (51, 61).

14. (Currently amended) A low-voltage circuit-breaker comprising an integrated positive-opening-operation mechanism, ~~which enables transfer to the mobile contact of at least part of the kinetic energy transmitted to the actuating device~~ which operatively connects an actuating device to a mobile contact that can be coupled to/uncoupled from a corresponding fixed contact, said positive-opening mechanism comprising:

first means for storing an amount of potential energy and converting said stored potential energy into kinetic energy that is in turn transmitted to said mobile contact during the movement of said actuating device; and

second means for directly transferring to the mobile contact at least a part of the kinetic energy that is used to actuate said actuating device.

15. (Original) The circuit-breaker according to claim 1, wherein said circuit-breaker comprises for each pole a double-interruption device.